

Appendix 1: ICD codes used to create outcome measures

Source: *OECD, Definitions of Health Care Quality Indicators, 2012-2013 HCQI data collection*

Diabetes short-term complications

ICD-9-CM	ICD-10-WHO
25010 dm keto t2, dm cont	E100 insulin-dependent diabetes mellitus with coma
25011 dm keto t1, dm cont	E101 insulin-dependent diabetes mellitus with ketoacidosis
25012 dm keto t2, dm uncont	E110 non-insulin-dependent diabetes mellitus with coma
25013 dm keto t1, dm uncont	E111 non-insulin-dependent diabetes mellitus with ketoacidosis
25020 dm w/ hyposm t2, dm cont	E130 other specified diabetes mellitus with coma
25021 dm w/ hyposm t1, dm cont	E131 other specified diabetes mellitus with ketoacidosis
25022 dm w/ hyposm t2, dm uncont	E140 unspecified diabetes mellitus with coma
25023 dm w/ hyposm t1, dm uncont	E141 unspecified diabetes mellitus with ketoacidosis
25030 dm coma nec typ ii, dm cnt	
25031 dm coma nec t1, dm cont	
25032 dm coma nec t2, dm uncont	
25033 dm coma nec t1, dm uncont	

Uncontrolled diabetes

ICD-9-CM	ICD-10-WHO
25002 dm, t2, uncont	E109 insulin-dependent diabetes mellitus without complications
25003 dm, t1, uncont	E119 non-insulin-dependent diabetes mellitus without complications
	E139 other specified diabetes mellitus without complications
	E149 unspecified diabetes mellitus without complications

Diabetes long-term complications

ICD-9-CM	ICD-10-WHO
25040 dm renal comp t2 cont	E102 insulin-dependent dm with renal complications
25041 dm renal comp t1 cont	E103 insulin-dependent dm with ophthalmic complications
25042 dm renal comp t2 uncnt	E104 insulin-dependent dm with neurological complications
25043 dm renal comp t1 uncnt	E105 insulin-dependent dm with peripheral circulatory complications
25050 dm eye comp t2 cont	E106 insulin-dependent dm with other specified complications
25051 dm eye comp t1 cont	E107 insulin-dependent dm with multiple complications
25052 dm eye comp t2 uncnt	E108 insulin-dependent dm with unspecified complications
25053 dm eye comp t1 uncnt	E112 non-insulin-dependent dm with renal complications
25060 dm neuro comp t2 cont	E113 non-insulin-dependent dm with ophthalmic complications
25061 dm neuro comp t1 cont	E114 non-insulin-dependent dm with neurological complications
25062 dm neuro comp t2 uncnt	E115 non-insulin-dependent dm with peripheral circulatory complications
25063 dm neuro comp t1 uncnt	E116 non-insulin-dependent dm with other specified complications
25070 dm circu dis t2 cont	E117 non-insulin-dependent dm with multiple complications
25071 dm circu dis t1 cont	E118 non-insulin-dependent dm with unspecified complications
25072 dm circu dis t2 uncnt	E132 other specified dm with renal complications
25073 dm circu dis t1 uncnt	E133 other specified dm with ophthalmic complications
25080 dm w comp nec t2 cont	E134 other specified dm with neurological complications
25081 dm w comp nec t1 cont	E135 other specified dm with peripheral circulatory complications
25082 dm w comp nec t2 uncnt	E136 other specified dm with other specified complications
25083 dm w comp nec t1 uncnt	E137 other specified dm with multiple complications
25090 dm w compl nos t2 cont	E138 other specified dm with unspecified complications
25091 dm w compl nos t1 cont	E142 unspecified dm with renal complications
25092 dm w compl nos t2 uncnt	E143 unspecified dm with ophthalmic complications
25093 dm w compl nos t1 uncnt	E144 unspecified dm with neurological complications
	E145 unspecified dm with peripheral circulatory complications
	E146 unspecified dm with other specified complications
	E147 unspecified dm with multiple complications
	E148 unspecified dm with unspecified complications

Appendix 2:

Table S2. Description of constructed scales, including which questions were included, which survey they were derived from and the reliability score on country-level.

	Scale	Questions	Survey	Reliability
Continuity of care				
Longitudinal continuity of care	1. long-term continuity	<ul style="list-style-type: none"> - Patient has own doctor, - Doctor knows medical background - Doctor knows living situation 	PE	0.897
Informational continuity of care	2. availability of medical information	<ul style="list-style-type: none"> - Doctor had medical records at hand - If visited another GP, he/she has necessary information at hand - When referred, GP informs medical specialists - After treatment by medical specialists, GP knows results 	PE	0.967
Coordination				
Skill mix in PC	1. disciplines working in practice (adapted relevant for diabetes)	<ul style="list-style-type: none"> - receptionist/medical secretary - practice nurse - community/home care nurse - nurse practitioner - assistant for laboratory work - physiotherapist - pharmacist 	GP	0.997
	2. diabetes chronic care management	<ul style="list-style-type: none"> - extra financial incentive for management of patients with diabetes - clinical guidelines for diabetes treatment - involvement in diabetes disease management program - offering special sessions for diabetic patients 	GP	0.995
Comprehensiveness				
Availability of medical equipment	1. availability of medical equipment (adapted relevant for diabetes)	<ul style="list-style-type: none"> - hemoglobin meter - any blood glucose test set - any cholesterol meter - ophthalmoscope - microscope - electrocardiograph - blood pressure meter 	GP	0.997
Task profile	2. first contact according to GP for common health problems	<ul style="list-style-type: none"> - child with severe cough - child aged 8 with hearing problem - woman aged 18 asking for oral contraception - man aged 24 with stomach pain - man aged 45 with chest pain - woman aged 50 with a lump in her breast - woman aged 60 with deteriorating vision 	GP	0.984

		<ul style="list-style-type: none"> - woman aged 60 with polyuria - woman aged 60 with acute symptoms of paralysis /paresis - man aged 70 with joint pain - woman aged 75 with moderate memory problems - man aged 35 with sprained ankle - man aged 28 with a first convulsion - anxious man aged 45 - physically abused child aged 13 - couple with relationship problems - woman aged 50 with psycho-social problems - man aged 32 with sexual problems - man aged 52 with alcohol addiction problems 		
Health promotion	3. health promotion	<ul style="list-style-type: none"> - regular blood pressure measurement - regular blood cholesterol level measurement - patient education about smoking, diet and problematic use of alcohol 	GP	0.967
Access				
Organizational access	1. patient experienced access	<ul style="list-style-type: none"> - opening hours too restricted - home visit when needed - practice is too far - have to wait too long, when calling the practice - know how to get evening, night and weekend services 	PE	0.856
	2. out-of-hours arrangements	<ul style="list-style-type: none"> - practice provides ooh in weekend - practice provides ooh in evening/nights 	GP	0.993

Appendix 3

Table S3: Pearson correlation matrix for included organizational primary care factors

	Long-term continuity	Medical information	Skill mix	Diabetes chronic care management	Medical equipment	Task profile GP	Health promotion	Organizational access	OOH care	No. hospital beds
Long-term continuity	1.0000									
Medical information	0.1906	1.0000								
Skill mix	-0.5313	0.3678	1.0000							
Diabetes chronic care management	0.1135	0.2654	-0.0630	1.0000						
Medical equipment	-0.3112	0.2323	0.4032	-0.2650	1.0000					
Task profile	0.0367	0.5322	0.2366	0.4574	0.2703	1.0000				
Health promotion	0.1379	0.0894	-0.0654	0.2727	-0.1347	0.0026	1.0000			
Organizational access	0.2419	-0.0770	-0.4889	0.3999	0.0706	0.0632	0.2247	1.0000		
OOH care	0.0501	0.3648	0.0766	0.0915	0.5505	0.4937	0.0476	0.3498	1.0000	
No. hospital beds	-0.0912	-0.5497	0.4416	-0.0149	-0.1190	-0.6771	0.2144	0.3169	-0.1425	1.0000